Biological Evaluation/Biological Assessment
For
Threatened, Endangered, and Sensitive (TES) Species
Horse Heaven Prescribed Burn
Mount Rogers National Recreation Area
George Washington and Jefferson National Forests
Wythe County, Virginia

Introduction

Forest Service Manual (FSM) Section 2672.41 requires a biological evaluation (BE) and/or biological assessment (BA) for all Forest Service planned, funded, executed, or permitted programs and activities. The objectives of this BE/BA are to: 1) ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native species or contribute to trends toward federal listing, 2) comply with the requirements of the Endangered Species Act (ESA) so that federal agencies do not jeopardize or adversely modify critical habitat (as defined in ESA) of federally listed species, and 3) provide a process and standard to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision-making process.

The Mount Rogers National Recreation Area supports known occurrences and suitable habitat for several TES species, all of which were considered in this analysis. This BE/BA documents the analysis of potential effects of the proposed project to TES species and associated habitat. It also serves as biological input into the environmental analysis for project-level decision making to ensure compliance with the ESA, National Environmental Policy Act (NEPA), and National Forest Management Act (NFMA).

A Biological Evaluation (BE) was previously completed and signed by Cecil Thomas, Area Wildlife Biologist on February 5, 1998 for a previous burn of this area. Several new species of concern were added to the Regional Forester's Sensitive Species Listing of 2001 and significant changes have been made to the methodology of BE preparation. Therefore, a new BE is warranted rather than an amendment.

Project Area and Cumulative Effects Analysis Area

The geographic scope of this biological analysis for terrestrial plants and animals is the project area. The geographic scope of the analysis for the Indiana bat is the entire George Washington and Jefferson National Forests (GWJNF). The geographic scope of the analysis for aquatic species is the National Forest boundary intersection with various tributaries flowing out of the project area including Henley Hollow, Jackson Hollow, Claybank Hollow, Poole Spring Branch, Laurel Hollow, and Rocky Hollow to the north and the East Fork Dry Run on the south flank. The project area is relatively distant from all listed tributaries except the East Fork Dry Run which has tributaries originating within the project area.

Past events have played a significant role in creating the vegetative condition existing within the proposed project area. The area was extensively harvested for lumber and

charcoal for iron furnaces during the late 1800's and early 1900's. The chestnut blight during the 1920's and 30's removed all of the American chestnut from the overstory and created openings that enabled previously overtopped trees, primarily oak species, to grow and replace the American chestnut. Some selective harvesting for lumber and firewood has been done within these second growth stands. Today, the forest is composed largely of a mixture of hardwoods including oaks and maples, along with white and yellow pine and hemlock. The understory is composed primarily of rhododendron, mountain laurel, white pine, mixed hardwood species, recurved fedderbush, and vaccinium spp.

Proposed Management Action

The proposed action is to treat approximately ~~900~~ 1060 CJ acres using prescribed fire to reduce fuel loading, improve habitat conditions for species requiring fire for rejuvenation, control the encroachment of white pine, and improve habitat conditions for a variety of wildlife species.

Future Actions

The agency is not presently aware of any other Forest Service project in the vicinity that would cause any cumulative effects to aquatic species occurring downstream within the East Fork Dry Run or other tributaries except for maintenance of existing road, trail and camping areas. These facilities usually receive some annual use requiring maintenance such as grading and ditch cleaning. There are no private lands within or adjacent to the project area within the upper reaches of these tributaries to cause any cumulative effects to water quality. There are no foreseeable future projects planned on National Forest System (NFS) land within the project area at this time that may have an effect on terrestrial plants and animals.

Species Reviewed

Federally listed threatened and endangered species, species proposed for federal listing, and Southern Region sensitive species (TES) that may potentially be affected by this project were examined using the following existing available information:

1. Reviewing the list of TES plant and animal species known or likely to occur on the George Washington and Jefferson National Forests, and their habitat preferences. This review included the U.S. Fish and Wildlife Service current list of endangered, threatened, and proposed species for the Forest, and the current Southern Region Sensitive Species list for the Forest, dated October 23, 2001 (list attached as Appendix A).

2. Consulting element occurrence records (EOR's) for TES species as maintained by the West Virginia Natural Heritage Program (WVNHP), the Virginia Division of Natural Heritage (VDNH), and supplied to the Forest.

3. Consulting with individuals in the private and public sector who are knowledgeable about the area and its flora and/or fauna.

4. Reviewing sources listed in the reference portion of this report.

5. Reviewing the results of past field surveys that may have been conducted in the area.

Most TES species known to occur on the Forest have unique habitat requirements, such as shale barrens, rock outcrops, bogs, caves, and natural ponds. Information gathered, analyzed, and presented in the Southern Appalachian Assessment dated July 1996 states that approximately 84% of threatened and endangered species and 74% of sensitive species are associated with rare or unique habitats, often referred to as rare communities. None of these unique habitats occur within the project area. Spring seeps and riparian habitats are somewhat unique and are present within the project area.

Through cooperative agreements between the Forest and VDNH and WVNHP, Special Biological Areas have been identified and delineated on the Forest. These include rare and significant natural communities and vegetative types. These areas reflect current knowledge of the location, management, and protection needs of rare species and associated significant natural communities on the Forest. These areas are identified in the George Washington Forest Plan as Special Interest Areas/Research Natural Areas (Management Area 4) and in a supplemental report from VDNH, dated July 2000, which identifies additional areas for consideration as Special Biological Areas. For the Jefferson National Forest, VDNH identified Special Biological Areas in an April 1996 report and a July 2000 supplement. Based on proposed project location, these Special Biological Area reports were reviewed as part of this analysis. No Special Biological Areas occur within the project area.

Appendix A of this document lists all 174 TES species currently known or expected to occur on or near the George Washington and Jefferson National Forests. All species on the list were considered during the analysis for this project.

A "step down" process was followed to eliminate species from further analysis and focus on those species that may be affected by proposed project activities. Species not eliminated are then analyzed in greater detail. Results of this "step down" analysis process are displayed in the Occurrence Analysis Results (OAR) column of the table in Appendix A. First, the range of a species was considered. Species' ranges on the Forest are based on county records contained in such documents as the Atlas of the Virginia Flora, but are refined further when additional information is available, such as more recent occurrences documented in scientific literature or in Natural Heritage databases. Many times range information clearly indicates a species will not occur in the project area due to the restricted geographic distribution of most TES species. When the project area is outside a known species range, that species is eliminated from further consideration by being coded as OAR code "1" in the Appendix A table. For this project, 121 species were eliminated from further consideration because the project area is not within the species known range.

After this first step, results from past surveys, knowledge of the project area, the potential for occurrence based on suitable habitat, and an actual field survey are considered for the remaining species. Species are eliminated from further consideration because of: a) a lack of suitable habitat in the project area (OAR code "2"); b) habitat present and the species has been searched for, but has not been found (OAR code "3"); c) the species is located in the project area, but out of the actual area of activity (OAR code "4"); and d) for aquatic species, they are known or suspected downstream of the project or activity area but outside of identified geographic bounds of water resource cumulative effects analysis area defined as point below which sediment amounts are insignificant (OAR

code "7"). Disposition of species considered are documented in the Appendix A table. For this project, 42 species were eliminated from further consideration because of one of the above reasons.

Field Survey and Results

The first field survey of the project area for rare plants, animals and potential or unique habitat was completed for the first Rx burn during the summer of 1997 by Cecil Thomas. No TES species or critical habitat for such was observed. A meander survey method was used primarily for plants. With this method, the surveyor walks slowly through unique habitats and the general forest area looking for rare plants at a time when they should be obvious. Random points are selected within the activity area with surveys being conducted at each point for species such as millipedes and woodland salamanders. Such surveys are usually conducted by looking under logs and rocks and sifting through the leaf litter for their presence. Captured specimens are usually identified and then released immediately. Some specimens of millipedes require dissection for identification to the species level. It would not be reasonable to attempt to survey the entire project area because of the size of the area.

Susan Powers, Botany Technician, conducted survey work and established monitoring plots for prescribed burning within the activity area on June 25, 2002. Two plots were inventoried and established to monitor the effects of prescribed fire on *Tsuga caroliniana* and other plants. No rare plants listed in this document other than *Tsuga caroliniana* were found.

An additional survey to determine the affects of the Hemlock wooly adelgid on populations of *Tsuga caroliniana* was done on February 19, 2004. A meander survey method was not made in this case. Previously identified populations were monitored to determine the extent of mortality as compared to *Tsuga Canadensis.* Monitored stems of *Tsuga caroliniana* did not appear to be affected to the degree of *Tsuga Canadensis* although some damage was evident. Significant mortality is occurring within Eastern hemlock stands in this area.

Species Identified as Being In the Activity Area or Potentially Affected by the Action

From past field surveys and knowledge of the area, and given the proposed action, those species which are analyzed and discussed further in this document are those that: a) are found to be located in the activity area (OAR code "5"); b) were not seen during the survey(s), but possibly occur in the activity area based on habitat observed during the survey(s) or field survey was not conducted when species is recognizable (OAR code "6"); and c) for aquatic species, they are known or suspected downstream of project or activity area and within identified geographic bounds of water resource cumulative effects analysis area (OAR code "8").

As a result of this process, the following species are either known to occur or may potentially occur within the project area:

OAR Code	Scientific Name	Common Name	Taxa	TES
6	*Myotis sodalis*	Indiana Bat	Mammal	Endangered
6	*Dixoria fowleri*	A millipede	Insect	Sensitive
6	*Aconitum reclinatum*	Trailing-white monkshood	Plant	Sensitive
6	*Berberis canadensis*	American barberry	Plant	Sensitive
6	*Cardamine flagellifera*	Bittercress	Plant	Sensitive
6	*Carex polymorpha*	Variable sedge	Plant	Sensitive
6	*Clematis coactilis*	Virginia white-haired leatherflower	Plant	Sensitive
6	*Monotropsis odorata*	Sweet pinesap	Plant	Sensitive
6	*Phlox buckleyi*	Sword-leaf phlox	Plant	Sensitive
6	*Pycanthemum torrei*	Torrey's Mountain Mint	Plant	Sensitive
5	*Tsuga caroliniana*	Carolina hemlock	Plant	Sensitive

Only *Tsuga caroliniana,* a GW&JNF Sensitive species, is known to occur within the activity area for this project. *Myotis sodalis*, an Endangered species may occur seasonally within the activity area. Nine additional species have the potential for occurrence in this area based on their general habitat requirements. Although plant and animal surveys have been completed for this area in the past, most of these species were not considered because they did not appear on the Regional Forester's Sensitive Species list at that time.

Cumulative Effects of Proposed Management Action on Each Identified Species

The analysis of possible effects to species identified as known or expected to occur in the vicinity of the proposed project, or likely to be affected by the action includes the following existing information:

1. Data on species/habitat relationships.
2. Species range distribution.
3. Occurrences developed from past field surveys or field observations.
4. The amount, condition, and distribution of suitable habitat.

Myotis Sodalis

Effects to the federally endangered Indiana bat (*Myotis sodalis*) were considered in this BE/BA because it is assumed the entire Forest is potential habitat for this species. See USFWS's Biological Opinion (BO) of September 16, 1997 and this agency's Environmental Assessment/Decision Notice of March 12, 1998 for the "Proposed Forest Plan Amendment for Management of the Federally Endangered Indiana Bat", herein referred to as the Bat Amendment EA (GW Amendment #6, Jefferson Amendment #7).

In the September 16, 1997 U.S. Fish and Wildlife Service's Biological Opinion concerning the Indiana bat on the Forest the following conclusion was reached, "After reviewing the current status of the Indiana bat, the environmental baseline for the action area, the effects of forest management and other activities on the GWJNFs, the Indiana Bat Recovery Strategy presented in the GWJNFs's biological assessment, and the cumulative effects, it is the Service's biological opinion that forest management and other activities authorized, funded, or carried out on the GWJNFs, are not likely to jeopardize the continued existence of the Indiana bat. Critical habitat for this species has been designated in Kentucky, Tennessee, Illinois, Missouri, and West Virginia. However, this action does not affect those areas and no destruction or adverse modification of that critical habitat will occur as a result of GWJNFs management activities". There are no foreseeable activities in the area that would directly affect the Indiana bat. Therefore there will be no cumulative effects to the Indiana bat.

The potential for this project to significantly affect the Indiana bat or its habitat is minimal because of the following:

1) There are no primary or secondary cave protection areas that serve as a hibernaculum for Indiana bats within 20 miles of the project.
2) The Indiana bat does not emerge from the caves where they spend the winter and disperse out into surrounding forest until very late March or early April. This burn will be completed prior to April 15. Therefore, no direct affect is expected on this species.
3) There is no evidence to suggest that Indiana bats use the activity area for summer roosting or maternity sites.
4) Some cavity trees and snags may be lost during the burn operation. However, there is not a shortage of this habitat within or nearby in the surrounding forest. The relatively small size of the area and the low intensity fire limits this indirect effect.
5) This burn would not adversely affect summer or fall foraging by the Indiana bat. There is some information indicating that opening up of the understory and midstory as is the case with this prescribed burn may actually enhance foraging habitat for the Indiana bat in forested conditions.

Dixoria fowleri is an insect that occupies general habitat conditions found within the prescribed burn area although documented evidence on specific habitat conditions is not readily available. It inhabits the leaf litter of deciduous forests and is relatively wide spread in the vicinity of this project but has not been found in great numbers anywhere. The species seeks cover from both climatic conditions and predators under the leaf litter, within the moist duff layer, or under rocks. The intent of the Forest Service is to produce a cool, slow moving fire that will leave the duff layer predominately intact during prescribe burn operations. This would provide some protection for such species. The forest has burned many times in the past under very dry weather and extreme fire conditions and this insect species has survived. In areas where fuels are concentrated some mortality could occur. The treatment area is very small in comparison to the

thousands of acres of similar habitat within the adjacent forest. It is my professional opinion that the adverse impacts of the project on this species, should it occur here, would be minimal and would not affect the viability of the species.

Aconitumreclinatum, Berberis canadensis, Cardamine flagellifera, Carex polymorpha, Clematis coactilis, Monotropsis odorata, Phlox buckleyi and *Pycanthemum torrei*, are all plant species that occupy similar habitat conditions and are found on soils such as those found within the project area. These habitat conditions are generally found over a wide area within the Blue Ridge and Ridge and Valley Provinces. There is no record of occurrence either on this specific site or on nearby lands as recorded by the VA Division of Natural Heritage. They are mentioned here only because of their potential for occurrence and they were not specifically surveyed for at a time when they could be identified. However, the prescribed burn is planned for completion by early April. This would be prior to emergence of these plants. Since the burn is to be completed under controlled conditions and with most of the duff layer left intact, no adverse affects would occur because of their dormancy during that time.

Tsuga caroliniana, (Carolina Hemlock) occurs within the proposed burn area either as individual stems or in small groups. It grows within a few feet of small tributaries to the East Fork Dry Run and on drier more upland sites as well. Some larger stems approach approximately 12 inches in diameter breast high and may exceed 40 feet in height. This species is known to colonize areas where soil disturbance has occurred such as along roads or old fields or wildlife clearings on the Mount Rogers NRA. These colonies may appear as dog hair stands or as single stems.

The effect fire may have on this species is largely dependent upon the intensity and duration of the fire and the size of the stem. Small seedlings are more susceptible to fire and may be destroyed by the prescribed burn operations while larger saplings and more mature trees are less likely affected. This statement is based on my monitoring of a previous prescribed burn in this same area that occurred in the spring of 1998 and a prescribed burn in the nearby Francis Mill Creek drainage completed in 2003. Many of the sites where this species occurs, such as along riparian areas, either will not sustain fire, or only at low intensity levels because of the damp conditions existing there. My recent monitoring produced no evidence that significant mortality, even in the seedling segment, of the population had occurred.

Recommendations For Reducing Potential Effects

<u>*Myotis Sodalis*</u>

1) Limit snag falling to the minimum necessary (usually 150 feet from the line) for control of the fire.
2) Known live trees with exfoliating bark, such as, but not limited to Shagbark hickory will be raked around to remove fuels to prevent them from igniting.

Tsuga caroliniana

1) Plan firing operations so fire is maintained at a low intensity level with less than 3 feet flame length on the ridges and less than 1 foot flame length within riparian areas.

2) Firing operations should begin along ridge tops, backing the fire down the slopes primarily. Strip-head fires, with less than 100 feet between strips, may be used in areas where Carolina hemlock does not occur and flame lengths can be maintained as above.

3) On the ground monitoring should occur during the burn operation to insure that Carolina hemlock is being protected and following the burn to assess any impacts the project may have had on this species. Additional monitoring should be done 2-3 years following the burn to determine the affects on seedling production.

Determination of Effect

For the Indiana bat this project will be in compliance with the BO issued by the USFWS on September 16, 1997 and therefore constitutes compliance with ESA Section 7 requirements. Since implementation of this project will be in compliance with, and tiers to, the BO that was issued as a result of formal consultation and it provides both specific Plan and project level direction, plus no new information has been identified as of this date, a finding of the effect to the Indiana bat for this proposed project is: "no effect, beyond that which is already disclosed in the Biological Assessment on Indiana bats dated April 30, 1997 and by the USFWS in the BO of September 16, 1997." Therefore, given the project level effects analysis for the Indiana bat and the authorized level of incidental take, further Section 7 consultation is not necessary for the Indiana bat.

Because there are no other T&E species or associated habitat present, the proposed project will have no effect on any other federally listed or proposed species.

The project will have no significant impact to any Southern Region sensitive species because of the previously discussed and following reasons: *Tsuga caroliniana* is known to occur over a relatively large portion of the east end of the NRA, that relatively small numbers of seedlings would be affected by the burn, the relatively small size of the area to be treated by fire, and the ability of this species to recolonize disturbed areas from the seeding of larger residual trees.

Prepared by:

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February 20, 2004

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Attachments: References

Appendix A – Forest TES List

References

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U.S.D.I. Fish and Wildlife Service. 1996. Draft Revised Recovery Plan for the Indiana Bat. U.S.D.I. Fish and Wildlife Service, Washington, DC.

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Existing Watershed Condition

The activity area lies primarily on the south, west and east aspects of the northern portion of Iron Mountain in Wythe County, Virginia. It is located within the Upper New River watershed (hydrologic unit code 05050001), and within the sub-watershed designated as N09 Cripple Creek and several small tributaries.

The geographic scope of the analysis for water and aquatic species is the National Forest boundary intersection with various tributaries flowing out of the project area to the north including Henley Hollow, Jackson Hollow, Claybank Hollow, Poole Spring Branch, Laurel Hollow, and Rocky Hollow and the East Fork Dry Run on the south flank.

The Commonwealth of Virginia conducts an assessment of water quality every two years in accordance with Section 305(b) of the Clean Water Act. This includes a watershed assessment of nonpoint source (NPS) pollution potential and a list and ranking of nonpoint source pollution priorities. Based on factors of agriculture, forestry, and urban sources, each watershed is assigned a rating of high, medium, or low. The assessment also includes a Natural Heritage Resources priority ranking, based on the presence of wetland and aquatic natural heritage species. Natural heritage resources include the habitat of rare, threatened, and endangered plant and animal species. The 1998 305(b) assessment assigned a nonpoint source ranking of "high " and a Natural Heritage Ranking of "medium" to watershed N09, Cripple Creek watershed.

The major stream draining the proposed project area is the East Fork Dry Run. This stream originates on National Forest lands, with several small tributaries draining out of the project area. The water chemistry and macroinvertebrates were sampled within these streams in 2000 and the results indicated they were in good condition. The East Fork Dry Run supports a reproducing population of wild brook trout.

Direct and Indirect Effects:

Some sediment occurs naturally in all stream systems and is part of the natural geologic processes. Natural watershed disturbance regimes of fire, flood, insect and disease result in a range of natural variability of sediment to which the stream channel has adjusted. However, human caused soil disturbing activities such as road or fireline construction activities using heavy can produce increased volumes of sediment delivery to streams that are in excess of the stream's ability to accommodate it. Excess sediment in streams can coat the stream bottom, fill pools, and reduce the carrying capacity of the stream for fish and stream insects. Fine sediment can fill the voids between gravel particles in the streambed, reducing the movement of aquatic insects, water and oxygen. The effects of sediment delivered to a stream channel diminish as watershed size increases. Most vulnerable are small sensitive headwaters catchments where such construction activities can have profound results. Rates of soil erosion and sedimentation are greatest at the time of soil disturbing activity and decrease as the soil stabilizes and vegetation begins to grow. Second year sediment rates are estimated to be only 35 percent of first year rates. After four years, sediment rates are normally back to pre-disturbance levels. However, once sediment is deposited in a stream channel, its effects can persist for decades or even centuries (Frissell, 1992).

The Forest Service plans to use existing roads and trails as fire control lines. Therefore, no heavy equipment will be used to construct containment lines. Existing roads and trails will be improved for fire containment by using a leaf blower to remove flammable leaves and other such fuels. Sediment production from this practice would be much less than routine maintenance of a road or trail where blading and cleaning of ditches is involved. The actual amount of sediment produced may vary depending on precipitation events during implementation of the project.

Entry of ash into aquatic ecosystems is sometimes mentioned as a reason for concern regarding water quality. This concern is more realistic where uncontrolled wildfires have burned during very dry periods, consuming most available fuels including the duff layer, and soils are left barren. Periods of moderate to heavy rain can flush ash and sediment down these slopes into a stream causing mortality to aquatic organisms. The proposal indicates the burn will be of low intensity aimed at removal of the litter layer and not the entire duff layer. This would reduce the amount of runoff during periods of rainfall and also causes more of the water to be absorbed into the soil. While it is inevitable that some ash will enter into the water from prescribed burns, the amount is considered minimal and does not cause significant damage to water or aquatic life.

There would be no measurable or significant direct or indirect affects to the water resource outside the geographical boundary set for this project.

Cumulative effects:
Only road and trail maintenance projects are planned or foreseen for this vicinity in the future. Because the direct and indirect effects are insignificant and immeasurable, there would be no cumulative effects associated with this project.

Effects associated with impaired stream segments downstream: An impaired section of stream has been identified approximately 4 miles downstream of the project within the Cripple Creek drainage between the communities of Speedwell and Cripple Creek. It is unclear at this time as to the reason for the impairment. It is suspected that it may be associated with fecal coliform bacteria or sedimentation. In either case, this project would have no effect on this impairment because the nature of the project does not add to the fecal coliform count and the insignificant and immeasurable volume of sediment produced by this project could not be detected this distance downstream of the project as previously stated.

References:

Virginia Department of Environmental Quality and Department of Conservation and Recreation (2002). Virginia Water Quality Assessment. 305(b) Report To The EPA Administrator And Congress For The Period January 1, 1996 To December 31, 2000. Richmond, VA.

Virginia Department of Environmental Quality. 2002. Virginia 303(D) Total Maximum Daily Load Priority List and Report. Richmond, VA.

Threatened, Endangered & Sensitive Species:

An issue was raised during public scoping regarding the effects of this project on Threatened, Endangered and Sensitive (TES) wildlife species. A total of 174 species that occur on the GW&JNF were considered in a Biological Evaluation completed for this project by the Area Wildlife Biologist. The affects were as follows:

For the Endangered Indiana bat "no effect, beyond that which is already disclosed in the Biological Assessment on Indiana bats dated April 30, 1997 and by the USFWS in the BO of September 16, 1997."

Because there are no other T&E species or associated habitat present, the proposed project will have no effect on any other federally listed or proposed species.

One "Sensitive" species is known to occur within the activity area, *Tsuga caroliniana*, Carolina hemlock. It was determined that although some impact to a small percentage of the total population occurring within this project area is expected, this impact would not be significant to affect the viability of this population and cause further listing in the future. The species is relatively widespread on the east end of the Mount Rogers National Recreation Area and monitoring has indicated that very few individual stems have been affected by previous prescribe burns.

For more specific information, refer to the Biological Evaluation.

Locally Rare Species:

Locally rare species for Wythe County, VA were considered. *Accipiter cooperi, Carex pedunculata, Conotyla celeno, Crataegus pruinosa, Eleocharis compressa, Paronychia virginica* var *virginica, Symphoricarpos albus* may occur within the project area although they were not found during any of the past field survey work. Some of the survey work was done at a time when some species were not recognizable. None of these species would be significantly impacted by this project due to the planned implementation dates, emergence dates of various plants, flowering dates, and the amount of potential habitat affected by the project in relation to the total amount available.

Old Growth Forest:

Several stands of old growth have been identified within the boundaries of this project. These occur primarily in hardwood forest types but some table mountain and pitch pine types also exist here. Older trees usually have thicker bark and can tolerate more heat from ground fire than younger trees. Species such as red maple, striped maple and white pine have become much more prevalent within the understory of the project area. Confers such, as those listed previously, require fire for opening cones and seed release. Many of these pine stands have become old and decadent with almost no regeneration because of the suppression of all fires in recent years.

Prescribed fire is sought to mimic a natural fire regime and this is usually a condition resulting from lightning caused fires. Lightning fires usually begin on high ridges and typically back down the slopes with short runs back to the top resulting in relatively low intensity type burns. Essentially this is what is done with prescribed firing techniques. The tops of the ridges are fired out by helicopter or by hand and the fire is allowed to

back down the slopes. Some short strips are fired and allowed to run upslope if flame lengths are not too high to cause unacceptable scorch.

Some individual old growth trees with decadent conditions at the base may ignite and burn. This is especially true if they are cavity trees. Monitoring following prescribed burns indicates that only a very small percentage of the overall stand is affected in this manner so the affect is considered insignificant. Some future cavity trees may be initiated on sites where debris may have built up adjacent to a tree. This can cause a butt rot and begin the process of cavity tree replacement.

Wildlife:

Many species of migratory birds are returning to this area to set up territories and begin nesting in March and April. Other yearlong residents also begin nesting during this period. Ground nesters such as but not limited to turkeys, grouse, woodcock, ovenbirds, and whip-poor-wills would be affected most with snag and cavity dwellers next. Although direct mortality is not expected to constitute a "take" of any of these species, indirect impacts such as nest destruction can occur. Many of these species are known to begin building nests in March with incubation occurring in April or May in this area. Most of these species have been found to renest when their' nests are destroyed by predators or climatic events.

The project area, although a relatively large prescribed burn, is very small in size when compared to the acreage of the similar habitat surrounding the project. Therefore, any affect on ground nesting birds would be considered minimal and insignificant to affect the viability of any of these populations.

Birds that nest either in the midstory or overstory would not be affected by this project. However, snag and cavity dwelling species such as woodpeckers and owls may be displaced temporarily by the proposed project. Very few cavity trees and only a slightly higher number of snags are destroyed by prescribed fire. Some snag and cavity recruitment may occur as a result of burning activities. The low intensity fires used in prescribe fire treatments normally minimize losses of snags and cavity trees.

Mitigation: All burning operations on this project must be completed by the end of April to allow time for birds to renest.

Management Indicator Species:

Black Bear populations would benefit significantly from this project in the short term because of the increase in vegetative and fruit bearing plants used by bears for food. Plants such as blueberry, huckleberry and blackberry are stimulated and increased by fire. Some cavity trees used by black bear could be destroyed by fire. Most cavity trees sought by bears for dens have openings located up on the trunk where limbs have broken off to create access to the interior, as opposed to cavities at the base of the tree. This makes the tree less susceptible to ignition from fire starting at the base.

Turkey populations appear very good in this area with numerous sightings made throughout the past year. Implementation of this burn will improve conditions for turkeys by opening up the understory so they can see greater distances and by increasing the source of fruits, berries, grasses and legumes. Prescribed fires can destroy turkey nests but research has shown that most turkey hens will renest when their nests are destroyed in early spring. Turkeys were observed, on more than one occasion in April and May of 2003, foraging and roosting within a prescribed burn that was completed only weeks earlier (Thomas, personal observation). The earlier burning operations can be completed, the better for turkey nesting. Burning should be completed by no later than May 1.

Deer: Presently deer numbers are below biological carrying capacity in this area because of the availability of quality browse and possible over-harvesting in the past. The proposed project will increase the quantity, quality and availability of browse. Deer herds should increase in this area.

Common Flicker: The abundance of this species is related to the amount of snags for feeding and nesting habitat within an area. A small reduction in snags is anticipated for the short term from implementation of this project although some new snags may occur over time as a result of the burn. Effects are not expected to be a significant due to the size of the project and the mobility of this particular species.

Pileated Woodpecker: The presence/absence of large snags is important to this species for food and cover. A small reduction in snags is anticipated for the short term from implementation of this project although some new snags may occur over time as a result of the burn. Very little change in habitat for this species is expected as a result of this project.

Barred Owl: This species requires large cavities for cover and uses its great night vision to search for food. The opening up of the understory should make it easier for owls to search for small mammals, a primary food source for them. Food supplies for small mammals may be reduced temporarily and then should increase over time. Barred owls will range over hundreds of acres in search of food. Large cavities have been addressed previously and the affects of fire would be similar.

2000 Locally Rare Plant And Animal List for Mt. Rogers National Recreation Area

WYTHE COUNTY Species	Habitat	Global Rank	State Rank	Federal Status	State Status	Forest Rank	OAR
Accipiter cooperii Cooper's hawk	Uncommon permanent resident in mountains and valleys; deciduous woodlands, forest edges and groves.	G4	S1S2			Locally Rare	6
Carex pedunculata Longstalk sedge	Rich woods, usually in calcareous soils	G5	S3			Locally rare	6
Cheilanthes eatonii Chestnut lipfern	Cliff crevices and tallus slopes; mts.	G5?	S2			Locally rare	2
Conotyla celeno Celeno millipede	Leaf litter within mixed hardwoods.	G1	S1			Locally rare	6
Crataegus pruinosa A hawthorn	Streambanks, woodlands, pastures and thickets. Sept.-Oct.	G5	S1			Locally rare	6
Cryptobranchus alleganiensis Eastern hellbender	Aquatic salamander that prefers large permanent, clear, cool to warm, fast flowing streams with many large, flat rocks and logs to provide shelter. New River & possibly Cripple Creek.	G4	S2S3			Locally rare	7
Eleocharis compressa Flattened spikerush	Fields & woods, usually basic or circumneutral soils	G4	S2			Locally rare	6
Glyceria acutiflora Sharp-scaled manna-grass	Muddy pools	G5	S3			Locally rare	2
Goodyera repens var. ophioides Dwarf rattlesnake plantain	Damp mossy woods	G5	S3			Locally rare	2
Houstonia canadensis Canada bluets	Rocky woods and hillsides. May, June	G4G5	S2			Locally rare	5
Loxia curvirostra Red Crossbill	On Mount Rogers and Whitetop associated with red spruce & fraser fir but may use pine-oak woods and northern hardwood/hemlock stands.	G5	S1			Locally rare	2
Neotoma magister Allegheny woodrat	Caves, talus slopes, rocky ledges, boulders & large rock outcrops; Usually above elevation .1000ft.	G5T3	S3			Locally rare	2

2000 Locally Rare Plant and Animal List for Mt. Rogers National Recreation Area

WYTHE COUNTY Species	Habitat	Global Rank	State Rank	Federal Status	State Status	Forest Rank	OAR
Paronychia virginica var virginica Yellow nailwort	Open or wooded places, crevices and ledges or rocky places, usually at low elevations. July-Oct	G4T1T 2Q	S1S2			Locally rare	6
Phacelia fimbriata Fringed scorpion-weed	Upland Woods	G4	S2			Locally rare	5
Sanicula trifoliata Large fruited sanicle	Rich woods	G4	S3			Locally rare	5
Spartina pectinata Freshwater cordgrass	Marshes and ditches July-Sept	G5	S2			Locally rare	2
Symphoricarpos albus Snowberry	Dry or rocky soil May-July	G5T4	S1			Locally rare	6
Viola walterii Prostrate blue violet	Moist flood-plains, old fields, open woods and bogs. May-June	G4G5	S1			Locally rare	2

OCCURRENCE CRITERIA
1 - Out of known species range.
2- Lack of suitable habitat.
3- Species present in project area but outside of activity area.
4- Field survey licated species within the activity area.
5- Species not found during the field survey.
6- Not found during field survey but still possible in activity area.
7- Species known or suspected downstream of project/activity area
8- Species is believed to be extirpated from the state.